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10/008,382	12/05/2001	Louise A. Koss	10010863-1	2960

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AGILENT TECHNOLOGIES, INC.  
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EXAMINER

KERVEROS, JAMES C

ART UNIT

PAPER NUMBER

2133

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/008,382

Applicant(s)

KOSS ET AL.

Examiner

JAMES C KERVEROS

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37-CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 03 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 03 August 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

This is a FINAL Office Action in response to Amendment filed 8/3/2004, responsive to the Office Action of 7 May 2004.

Claims 1-8 were previously examined. Claim 9 is new.

Claims 1-9 are pending and presented for examination.

Objections to the Drawings and abstract of the disclosure, as required by the prior Office Action of 7 May 2004, are withdrawn, in view of the corrections made by the Amendment.

Claims Objection is withdrawn in view of adding line indentations as required by the Office Action.

Claims rejection under 35 U.S.C. 112, second paragraph, as being indefinite for insufficient antecedent basis, are withdrawn in view of the Amendment.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 8 and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Bhavsar et al. (US 6408401).

Regarding Claims 1, 9, Bhavsar discloses an electronic circuit, such as Logic 201 which resides on the chip 12 for performing a self-test and self-repair on embedded target RAM segment 251 including a RAM array 81 having a plurality of memory storage cells organized into a plurality of slice arrays (91), Column Slices (0-82) in the RAM array 81, as shown in FIGS. 1, 2 and 4, comprising:

A control circuit, such as RAM Test Algorithm Engine (207) of test and repair logic circuit (201), which generates address, data and read/write control signal (221) sequence.

An address selection circuit (Address and Read/Write Data path Logic 255), directed by the RAM Test Algorithm Engine (207) via the memory bus 20 to index through memory address 94 of RAM array 81.

An input/output circuit, such as a typical line driver/receiver I/O circuitry in the bi-directional memory bus (20, FIG. 1) for writing and reading data associated with each slice array (91).

The RAM Test Algorithm Engine 207 performs the self-test on the selected segment by alternately writing and reading 0s and 1s to the memory cells within the RAM segment 81 into its associated slice array (91) at an indexed memory address, according to a memory test algorithm. In the read operation, each data output bit 97 from the multiplexers 96 passes through the Column Repair Register and Logic 302, which are then compared by XOR gates 98 with expected reference data fed to D0 -

D82 respectively. If the output value 97 is not the same as the expected written value D0 -D82, an XOR gate outputs a logic "1".

An error detection circuit, such as a column ID encoder circuit 100, collects comparison results from XOR 98 and upon an error, asserts an error signal 223 and provides the address 225 of a detected bad column slice.

Regarding Claim 2, Bhavsar discloses an electronic circuit 201 embedded in a RAM circuit chip 12 in an integrated circuit.

Regarding Claim 3, Bhavsar discloses a control circuit (RAM Test Algorithm Engine 207) and address selection circuit (Address and Read/Write Data path Logic 255), which are embedded in a control and address block of the RAM circuit chip 12.

Regarding Claim 4, Bhavsar discloses a BBE 203 part of the control circuit (201), which initiates (begins) testing sequence at power up when the DoPwrBB signal 241 is asserted, or during manufacturing testing when the DoMfgBB signal 242 is asserted. The BBE asserts the Bbedone signal 243 when the test is terminated (completed) and provides a pass/fail signal 244 to indicate whether RAM is repairable. The address selection circuit (255) informs the control circuit (207) when the indexed memory address (94) equals an initial self-test memory address, and when (94) equals a final self-test memory address.

Regarding Claim 5, Bhavsar discloses an address selection circuit (Address and Read/Write Data path Logic 255) comprising:

Address multiplexers (95 and 96), having address-multiplexer inputs and address-multiplexer outputs, for selecting a particular row and column using the row

address portion 94A and the column address 94B portion of the address 94 for RAM array 81. The address multiplexer receives test memory address from (RAM Test Algorithm Engine 207) during the self-test and it also receives normal operational data addresses from core logic 16 which accesses the RAM 80 via the memory bus 20 which carries address, data and control signals.

A row and column repair register 304 and 302 respectively for addressing the RAM 80 memory in writing and reading self-test data.

A sequencer counter 330 and a comparator (XOR 98), which compares the output value 97 with the expected value D0-D82. If the output value 97 is not the same as the expected written value D0 -D82, then the XOR gate outputs a logic "1" to the column ID encoder circuit 100, which provides an error signal 223 and the address 225 of a detected bad column slice.

Regarding Claim 6, Bhavsar discloses an address multiplexer (95 and 96), register (304 and 302), sequencer (counter 330) and comparator (XOR 98), which are all embedded in a control and address block of the RAM circuit chip 12, FIG. 1.

Regarding Claim 8, Bhavsar discloses an input to the error detection circuit (column ID encoder circuit 100) connected to the exclusive-OR-gate (XOR 98) output, FIG. 4.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the

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subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhavsar et al. (US 6408401) in view of Gupta et al. (US 6609222).

Regarding Claim 7, Bhavsar substantially discloses a bi-directional memory bus (20, FIG. 1) for writing and reading test or normal data into each slice array (91). Further, he discloses comparator (XOR 98), which compares the output data value (97) from the slice array with the expected data value (D0-D82). However, Bhavsar does not explicitly disclose the exact data-in multiplexing configuration for receiving self-test data or normal operational data for writing into the slice array and an output-complement multiplexer for comparing the test data to data in the slice array.

Furthermore, Gupta in an analogous art discloses FIG. 3 a CAM circuit capable of operating BIST operations including a number of multiplexers (322, 324, and 326) for operating in the BIST mode or in the functional mode. Multiplexer 322 and 324 are coupled to the row and block address decoders, and the multiplexer 326 is coupled to the read/write port for introducing data to the CAM core during a writing operation. Multiplexer 320 accept search data (e.g., 64 bits of data and 4 tag bits) from a BIST search interface (SIF) 312 and functional search data, and can be controlled to operate in either functional mode or BIST mode.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to incorporate the multiplexers, as taught by Gupta, in the bi-

directional memory data bus of Bhavsar for the purpose of reading / writing data in a memory device and then comparing the output data from the memory device with a reference data, using a significantly simpler built-in self-test/built-in self-repair (BiST/BiSR) logic. The combined scheme of Bhavsar and Gupta affords a greater flexibility in spare resource allocation and therefore can result in higher yield while utilizing simplified self-test/self-repair logic. A further advantage is the ability of the BIST testing to execute uninterrupted searches at each cycle, while simultaneously performing writes that set up subsequent searches, which enables BIST testing of a CAM core at more realistic speeds.

### ***Response to Arguments***

Applicant's arguments filed 8/3/2004 have been fully considered but they are not persuasive. Claims 1-6 and 8 are rejected under 35 U.S.C. 102(e) as being anticipated by Bhavsar et al. (US 6408401), and Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bhavsar et al. (US 6408401) in view of Gupta et al. (US 6609222), ass et forth in the present Office Action.

In reference to claims rejected under 35 U.S.C. 102(e) as being anticipated by Bhavsar, the Applicant argues that Bhavsar does not disclose a "control circuit embedded in a control and address block of a circuit", as amended in independent claim 1. However, in response to argument, as stated in the Office Action above, Bhavsar discloses a control circuit, such as RAM Test Algorithm Engine (207) which is integrated in the test and repair logic circuit (201), which resides on the chip 12 for



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performing a self-test and self-repair on "embedded target RAM segment 251". Even though, Bhavsar does not explicitly specify that the control circuit (207) is embedded, clearly the control circuit (207) is integrated in the logic circuit (201) for performing a self-test and self-repair on "embedded target RAM segment 251". Therefore, the control circuit (207) is embedded by virtue that the target RAM segment 251 is also embedded on chip 12. Assuming, for the sake of argument, that the control circuit (207) is not embedded as argued by the Applicant, it is noted the amended limitation, "control circuit embedded in a control and address block of a circuit", is too broad in scope and therefore it does not distinguish over the prior art, since it fails to provide more detailed explanation of how the control circuit is embedded in a circuit. Furthermore, one of the definitions of the term "embedded" in the Webster's II Dictionary is "to make integral part of", which implies that the control circuit (207) is integral part of the test and repair logic circuit (201), as disclosed by Bhavsar.

***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JAMES C KERVEROS whose telephone number is (571) 272-3824. The examiner can normally be reached on 9:00 AM TO 5:00 PM.

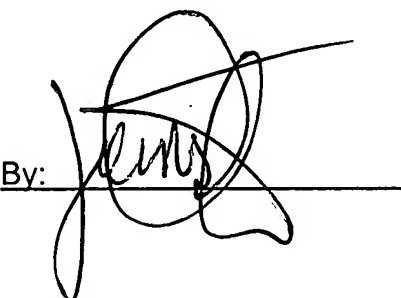
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Date: 1 February 2005  
Office Action: Final Rejection

By: 

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Examiner  
Art Unit 2133

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